

Rhodora

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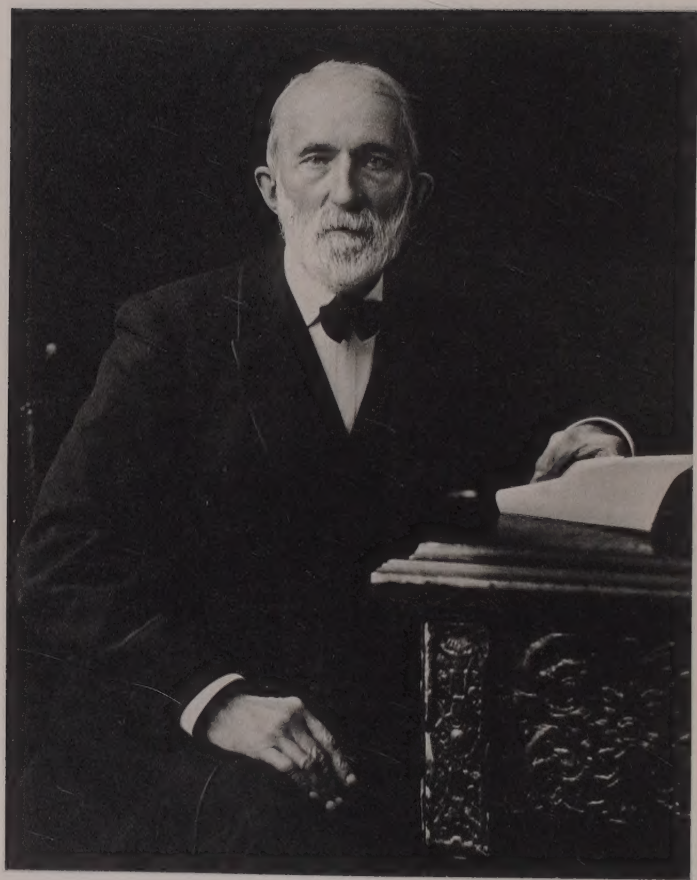
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Very Truly Yours
George E. Davenport

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GEORGE EDWARD DAVENPORT.

F. S. COLLINS.

(With portrait.)

GEORGE EDWARD DAVENPORT was born in Boston, August 3d, 1833, the son of William E. and Deborah (Skidmore) Davenport, both of old Boston families. He completed the regular public school course, graduating from the High School. At twenty years of age he married Miss Mary Francis and removed to South Boston, remaining there until 1875, after which date his home was at Medford. He died November 27, 1907, leaving a wife, eight children, ten grandchildren and one great grandchild.

Even in his school days he was much interested in nature studies, soon concentrating the interest on botany, later making ferns a specialty, which they remained all of his life. The study, however, had to be pursued in what time was left from an active business, which he kept up till two years before his death. In all the study of the ferns for the past forty years he had a noteworthy part; though no work of great volume remains from his pen, his influence is to be seen in much of what has been published by others, and his shorter articles are to be found in many botanical publications, notably the Bulletin of the Torrey Botanical Club, the Fern Bulletin and Rhodora. The bibliography of these articles at the end of this note, compiled by Miss Mary A. Day of the Gray Herbarium, is probably fairly complete, but does not attempt to include the many articles he wrote referring more especially to forestry or horticulture. He had long been at work on a manual of the North American ferns, but when his release from business cares gave him the time he so much needed for the task, sight and strength were no longer equal to it, much to his sorrow. The last

two years his time was largely spent in his garden; here in small compass was a remarkable variety of conditions, rich ground, swamp, rocky hillside; here he had growing nearly every fern found in New England, and here too he watched with much interest a little group of flowering plants, selected as best showing the phenomena of heredity and mutation that now attract so much interest. The enthusiasm with which he showed me these treasures one Sunday morning early in last October, will always be a most pleasant recollection.

It would seem that an active business life and the thorough study of a specialty would be all that one could achieve; but he had other interests as well. He was an active worker in the anti-slavery movement, one of the first to be interested in labor reform questions, a leading spirit in the work of securing for the public the Middlesex Fells, and for eighteen years he was a member of the school board of Medford. He was an original member of the New England Botanical Club, a life member of the Massachusetts Horticultural Society and a fellow of the American Academy of Arts and Sciences.

I first became acquainted with him at the time of the formation of the Middlesex Scientific Field Club, of which he was one of the chief promoters; in the many excursions we made in the Fells region and elsewhere in the county he was a leader, and his knowledge of the region was of much value for the Flora of the county, published by the Middlesex Institute; he was always ready to give his time and advice to those of us who were then beginners, and whose ignorance must have seemed to him monumental. He was a man of strong and enduring attachments; sensitive as a woman, but with a man's courage in defense of his convictions. Whatever he believed in he championed with an almost passionate devotion; whether it were the giving of freedom to the slave, the rescuing of the Fells from destruction, or the true theory of the terminal bud of *Botrychium*, he would fight for it as long as his strength endured. That others could not take the same stand, indeed might hold other views, seemed often to surprise and distress him, but never impaired his kindness of heart to the delinquents. Though a careful student of details of structure and development, he never lost sight of the beauty of the living plant, and he was a lover of nature all his life. No more fitting end to his life can be imagined than that which came to him, in open air, among the familiar objects of his loved Middlesex Fells, now, so much by his own exertions, safe for all time.

THE BOTANICAL WRITINGS OF THE LATE GEORGE
EDWARD DAVENPORT.

[The following list of Mr. Davenport's writings has been kindly prepared at our request by Miss Mary A. Day to accompany the above sketch. It is due to Miss Day to state that the compilation has been made with unavoidable haste and during pressure of other work. Although a wide range of periodical literature has been examined and all Mr. Davenport's botanical papers and notes have been included so far as they have been found, it is quite possible that some titles have been overlooked, especially as Mr. Davenport's botanical activity extended through a long period of years and his publications have been widely scattered. — Ed.]

1. CATALOGUE OF NORTH AMERICAN FERNS IN THE HERBARIUM PRESENTED TO THE MASSACHUSETTS HORTICULTURAL SOCIETY BY GEORGE E. DAVENPORT, June 5, 1875.
- 1a. FLORA OF MEDFORD [WITH A FULL ACCOUNT OF THE FERNS OF MASSACHUSETTS. BEING A SERIES OF PAPERS PUBLISHED IN THE MEDFORD CHRONICLE]. 1875-1876.
2. ASPLENIUM FILIX-FOEMINA, BERNH. VAR. LACINIATUM, MOORE. Bull. Torr. Bot. Club, vi. 88. Apr. 1876.
3. ASPIDIUM THELYPTERIS, SWZ. Bull. Torr. Bot. Club, vi. 113. Oct. 1876.
4. FORKING FERNS. Bot. Gaz. ii. 80-81. Feb. 1877.
5. ASPIDIUM SPINULOSUM SWZ. Bot. Gaz. ii. 81. Feb. 1877.
6. VARIATIONS IN LOMARIA AND POLYPODIUM. Bull. Torr. Bot. Club, vi. 136. Feb. 1877.
7. ASPLENIUM FILIX-FOEMINA, VAR. LACINIATUM MOORE. Bull. Torr. Bot. Club, vi. 168. Aug. 1877.
8. VITALITY IN FERNS. Bot. Gaz. ii. 134. Sept. 1877.
9. BOTRYCHIUM LUNARIA IN NEW YORK STATE. Bull. Torr. Bot. Club, vi. 176. Sept. 1877.
10. VARIATIONS OF COLOR IN FLOWERS. Bot. Gaz. ii. 141-142. Oct. 1877.
11. NOTES ON BOTRYCHIUM SIMPLEX, HITCHCOCK. Nov. 1877.
12. A NEW CHEILANTHES. Bull. Torr. Bot. Club, vi. 190-191. Dec. 1877.
13. VERNATION IN BOTRYCHIA, WITH SPECIAL REFERENCE TO ITS IMPORTANCE AS A MEANS FOR DISTINGUISHING THE DIFFERENT SPECIES. Bull. Torr. Bot. Club, vi. 193-199, plate. Jan. 1878.

14. *ASPLENIUM EBENOIDES*, R. R. SCOTT. Bull. Torr. Bot. Club, vi. 200. Jan. 1878.
15. *CAMPTOSORUS* IN EASTERN MASSACHUSETTS. Bull. Torr. Bot. Club, vi. 206. Feb. 1878.
16. *BOTRYCHIUM SIMPLEX*, HITCHC., IN MASS. Bull. Torr. Bot. Club, vi. 234. June, 1878.
17. POLYGAMOUS FLOWERS IN *POPULUS*. Bot. Gaz. iii. 51. June, 1878.
18. FERNS OF KENTUCKY. Bot. Gaz. iii. 54-55. June, 1878.
19. *ASPIDIUM SPINULOSUM* (SWARTZ) AND ITS VARIETIES. Am. Nat. xii. 707-717. Nov. 1878.
20. CATALOGUE OF THE "DAVENPORT HERBARIUM" OF NORTH AMERICAN FERNS NORTH OF MEXICO. Salem, 1879.
21. *ASPIDIUM BOOTHII* TUCKERMAN. Am. Nat. xiii. 186-188. Mar. 1879.
22. FERN ETCHINGS. BY JOHN WILLIAMSON, AUTHOR OF THE FERNS OF KENTUCKY, LOUISVILLE, KY. JOHN P. MORTON & Co., PUBLISHERS. Bull. Torr. Bot. Club, vi. 351. Oct. 1879.
23. *TRAPA NATANS*. Bull. Torr. Bot. Club, vi. 352. Oct. 1879.
24. *PTERIS AQUILINA*. Bot. Gaz. v. 30-31. Mar. 1880.
25. A NEW FERN. Bull. Torr. Bot. Club, vii. 50-51. May, 1880.
26. FERN NOTES. Bull. Torr. Bot. Club, vii. 85-86. Aug. 1880.
27. "SYSTEMATIC FERN-LIST." Bot. Gaz. v. 131-132. Oct. 1880.
28. VERNATION OF *BOTRYCHIUM BOREALE*, MILDE. Bull. Torr. Bot. Club, vii. 115-116. Nov. 1880.
29. THE FLORA OF ESSEX COUNTY, MASSACHUSETTS, JOHN ROBINSON, ESSEX INSTITUTE, SALEM, 1880. Bot. Gaz. vi. 187-188. Mar. 1881.
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31. A NEW AMERICAN FERN. Bull. Torr. Bot. Club, viii. 61-62, pl. 8. June, 1881.
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33. "OUR NATIVE FERNS." Bot. Gaz. vi. 264. Sept. 1881.
34. VERNATION IN *BOTRYCHIA*. Bull. Torr. Bot. Club, viii. 100-101. Sept. 1881.

35. *ONOCLEA SENSIBILIS*, VAR. *OBTUSILOBATA*. Bull. Torr. Bot. Club, viii. 109-111. Oct. 1881.
36. *CHEILANTHES MYRIOPHYLLA*, DESV. Bull. Torr. Bot. Club, viii. 116. Oct. 1881.
37. *WOODSIA OBTUSA*, TORREY. Bull. Torr. Bot. Club, viii. 116. Oct. 1881.
38. AN INTERESTING FERNERY. Bot. Gaz. vi. 295-296. Dec. 1881.
39. FERN NOTES. III. Bull. Torr. Bot. Club, ix. 20-23. Feb. 1882.
40. A BIT OF FERN HISTORY. Bot. Gaz. vii. 60-64. May, 1882.
41. FERN NOTES. IV. Bull. Torr. Bot. Club, ix. 68-69. May, 1882.
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45. SOME ALASKA FERNS, WITH NOTES. Bot. Gaz. vii. 96-97. Aug.-Sept. 1882.
46. ALBINISM IN *GENTIANA CRINITA*. Bot. Gaz. vii. 135. Nov. 1882.
47. ALASKA FERNS. Bot. Gaz. viii. 160. Jan. 1883.
48. FERN NOTES. VI. Bull. Torr. Bot. Club, x. 4-7. Jan. 1883.
49. SOME COMPARATIVE TABLES SHOWING THE DISTRIBUTION OF FERNS IN THE UNITED STATES OF NORTH AMERICA. Am. Phil. Soc. Proc. xx. 605-612. Feb. 1883.
50. CATALOGUE OF THE DAVENPORT HERBARIUM. SUPPLEMENT. Mar. 1883.
51. *ASPIDIUM LONCHITIS* SWZ. Bull. Torr. Bot. Club, x. 40. Apr. 1883.
52. NORTH AMERICAN FERNS. Apr. 1883.
53. A NEW FERN. Bull. Torr. Bot. Club, x. 61-62, pl. 34. June, 1883.
54. JOHN WILLIAMSON.— OBITUARY. Bot. Gaz. ix. 122-126. Aug. 1884.

55. FERN NOTES. VII. Bull. Torr. Bot. Club, xii. 21-24. Feb. & Mar. 1885.
56. LINES ON DR. ASA GRAY'S SEVENTY-FIFTH BIRTHDAY, NOVEMBER 18, 1885. Bot. Gaz. xi. 9. Jan. 1886.
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58. FERN NOTES. VIII. Bull. Torr. Bot. Club, xiii. 81-82. May, 1886.
59. FERN NOTES. IX. LIST OF FERNS COLLECTED ON THE MOUNTAINS NEAR THE CITY OF CHIHUAHUA, MEXICO, DURING THE SEASON OF 1885, BY C. G. PRINGLE, OF CHARLOTTE, VERMONT. Bull. Torr. Bot. Club, xiii. 129-135, pl. 58. Aug. 1886.
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64. FILICES MEXICANAE. II. Gard. & For. iv. 483-484, fig. 75. Oct. 1891.
65. FILICES MEXICANAE. III. Gard. & For. iv. 519-520, fig. 80. Nov. 1891.
66. FILICES MEXICANAE. IV. Gard. & For. iv. 555-556, fig. 88. Nov. 1891.
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74. [LETTER RELATING TO THE BOSTON FERN, *NEPHROLEPIS EXALTATA*, VAR. *BOSTONIENSIS* DAVENPORT, N. VAR.] The New England Florist, ii. 136–137, reprinted on p. 150, figures. Sept. 1896.
75. *ASPIDIUM CRISTATUM* × *MARGINALE* DAVENPORT. Gard. & For. ix. 444–446, fig. 58. Nov. 1896.
76. ON THE USE OF THE TERM “FROND” AS APPLIED TO FERNS. Bot. Gaz. xxii. 497–498. Dec. 1896.
77. *ASPIDIUM SIMULATUM*. Gard. & For. ix. 484, fig. 69. Dec. 1896.
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79. WIND-BLOWN FERNERIES. Fern Bull. v. 24–25. Apr. 1897.
80. *BOTRYCHIUM TERNATUM* SWZ., AND ITS VARIETIES. Fern Bull. v. 40–43. July, 1897.
81. ABNORMAL FORMS OF HYBRIDITY IN FERNS. Linnaean Fern Chapter (Boston Meeting), 1–11. 1899.
82. *ACROSTICHUM LOMARIOIDES* JENMAN. Bull. Torr. Bot. Club, xxvi. 318–319. June, 1899.
83. *LYCOPodium ALOPECUROIDES*. Fern Bull. vii. 97. Oct. 1899.
84. FERNS OF MARANACOOK, MAINE. Rhodora, i. 218–220. Dec. 1899.
85. JOHN WILLIAMSON. Fern Bull. viii. 1–5. Portrait. Jan. 1900.
86. TO FERN COLLECTORS. Rhodora, ii. 212. Oct. 1900.
87. *DICKSONIA PILOSIUSCULA*, VAR. *CRISTATA*. Rhodora, ii. 220–221. Nov. 1900.
88. A PLEA FOR THE PRESERVATION OF OUR FERNS. Society for the Protection of Native Plants, Leaflet 3. 1901.

89. A PLUMOSE VARIETY OF EBONY SPLEENWORT. *Rhodora*, iii. 1-2, pl. 22. Jan. 1901.
90. *BOTRYCHUM MATRICARIAEFOLIUM* A. BR. *Fern Bull.* ix. 37-38, Apr. 1901.
91. MISCELLANEOUS NOTES ON NEW ENGLAND FERNS AND ALLIES. *Rhodora*, iii. 223-225. Sept. 1901.
92. THE "AMERICAN FERN BOOK" OR "OUR FERNS IN THEIR HAUNTS" BY WILLARD N. CLUTE, WITH ILLUSTRATIONS BY WILLIAM WALWORTH STILSON. *Rhodora*, iii. 238. Sept. 1901.
93. TWO NEW FERN LISTS. I. *Fern Bull.* ix. 77-80. Oct. 1901.
94. MISCELLANEOUS NOTES ON NEW ENGLAND FERNS. II. *Rhodora*, iii. 266-270. Nov. 1901.
95. MISCELLANEOUS NOTES ON NEW ENGLAND FERNS. III. *Rhodora*, iv. 7-13. Jan. 1902.
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97. MISCELLANEOUS NOTES ON NEW ENGLAND FERNS. IV. *Rhodora*, iv. 49-55. Mar. 1902.
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101. MISCELLANEOUS NOTES ON NEW ENGLAND FERNS. VI. *Rhodora*, vi. 31-33. Feb. 1904.
102. THE DEATH OF WILLIAM WENDTE. *Rhodora*, vi. 209-210. Oct. 1904.
103. MIDDLESEX FELS CHANGES. SOME OF THEIR EFFECTS UPON NATIVE PLANTS. *Boston Evening Transcript*, Mar. 17, 1905.
104. A NEW TYPE OF ANEIMIA. *Fern Bull.* xiii. 18-21. Apr. 1905.
105. THE CHANGED MIDDLESEX FELS. *Boston Evening Transcript*, May 26, 1905.
106. REVERSIONS AND THEIR FLUCTUATIONS. *Fern Bull.* xiii. 106-107. Dec. 1905.
107. A HYBRID *ASPLENIUM* NEW TO THE FLORA OF VERMONT. *Rhodora*, viii. 12-15. Feb. 1906.
108. *BOTRYCHUM MATRICARIAEFOLIUM* A. BR. AN ENQUIRY INTO THE RELATIONSHIPS BETWEEN *BOTRYCHUM NEGLECTUM* WOOD, *BOTRYCHUM MATRICARIAEFOLIUM* A. BRAUN, AND

BOTRYCHIUM RAMOSUM ASCHERSON. Fern Bull. xiv. 11–19, pl. 1, 2. Mar. 1906.

109. THE FORMS OF BOTRYCHIUM SIMPLEX. Fern Bull. xiv. 84–85. July, 1906.

Articles relating to Mr. Davenport's herbarium and work.

THE DAVENPORT HERBARIUM. Bull. Torr. Bot. Club, vi. 51–54, 1875; 314–315, 1879.

CATALOGUE OF NORTH AMERICAN FERNS. [Notice of] Bull. Torr. Bot. Club, vi. 273. 1878.

[EDITORIAL NOTE ON WORK OF MR. DAVENPORT.] Fern Bull. viii. 70. 1900.

[ACCOUNT OF HERBARIUM.] Rhodora, iii. 220. 1901.

[EDITORIAL NOTE ON LIFE AND WORK OF MR. DAVENPORT, WITH PORTRAIT.] Fern Bull. ix. 44. 1901.

NOTES ON FUNGI,—I.

W. G. FARLOW.

TREMELLA RETICULATA. While botanizing at Lake Dunmore, Vermont, in September, 1896, I found a quantity of a tremellinaceous fungus growing over the ground and fallen branches in a coniferous wood. The season was very wet and the fungus, owing to the rain, was in places reduced to shapeless masses, but there remained a number of specimens which retained their normal habit. From a solid gelatinous base there rose to the height of 7.5 cm. (3 inches) or more masses of a white jelly, which resembled in outline certain large and coarse species of *Cladonia*, as *C. Boryi* Tuckerm. Subcylindrical branches arose from a common base, more or less anastomosing below, reticulated and becoming free and irregularly forking upwards, the branches gradually tapering to the tips, which were fimbriate. The color when fresh was white except at the tips, which were somewhat yellowish or brownish. In drying, the whole fungus shrivelled very much and became a yellow brown. Microscopic examination showed

a typical tremelline structure, with hyphae embedded in jelly and basidia divided vertically into four parts. The spores, which were not very abundant in specimens examined, were broadly allantoid or broadly elliptic with one side flattened and the lower part apiculate on the inner side. They measured $8\text{ }\mu\text{--}10\text{ }\mu \times 5\text{ }\mu\text{--}6\text{ }\mu$. The germination could not be studied.

When fresh and in good condition the fungus is very striking and does not resemble any other of our *Tremellinaceae* known to me. An examination of the literature led me at first to think that the species was *Tremella fuciiformis* Berk. from the Amazon, described in Hooker's Jour. Bot. 1856, p. 277 and later recorded from Cuba in Jour. Linn. Soc. 10, 340, 1869. A later examination, however, convinced me that the fungus is the same as that described by Berkeley under the name of *Corticium tremellinum* B. & Rav., var. *reticulatum* Berk. in Grevillea 1, 180, June, 1873. In explanation of my reasons for forming this opinion it is necessary to refer to certain specimens which I have examined.

In Herb. Curtis are four specimens marked *Corticium tremellinum* including the variety *reticulatum*. The first, from the collection cited in Grevillea, is marked "In caudice Filicis? Cotoosa Springs, Ga., 1853. Ravenel (1754)"; the second is marked "Ad basin culm. et gramin., Sept. 1855. Ala. Super. Peters (897)"; the third is marked "(6393) Wisconsin, coll. Lapham. Sprague (996)." The three specimens above named are all called *C. tremellinum*, the fourth is marked "*Corticium reticulatum*. Damp naked earth under shrubbery in a garden, Penna., 1851. Michener (1212) (3942)," the collection cited in Grevillea under the variety *reticulatum*. There are besides two duplicate specimens from Michener inserted in Herb. Curtis and all three specimens are identical in structure.

The specimen of Lapham from Wisconsin may be excluded from consideration, since it shows no characteristic structure and is a mixture of different things entangled in hyphae which cannot be referred to any particular genus. In the next place, an examination of the other three specimens shows that none of them belongs to the genus *Corticium* but that all are *Tremellinaceae*, since they have the characteristic 4-parted basidia. The specimen from Cotoosa Springs (Ravenel) and that from Alabama (Peters) appear to be the same species, but the so-called variety, Pennsylvania (Michener), is quite different. The former are more or less bullate masses, wrinkled and

cerebriform on the surface as is the case in several species of *Tremellinaceae*. The specimens from Michener are undoubtedly the same as the fungus collected at Lake Dunmore.

Of specimens of *T. fuciformis* Berk. there is in Herb. Curtis one from Cuba marked "Ad lign. corrump. Sept. C. Wright (233). This specimen has a certain general resemblance to *C. reticulatum*, but a microscopic examination shows that it is a much thinner and more delicate species; the hyphae are not closely compacted and the hymenium is looser and thinner. Furthermore, although the specimen is by no means all that could be desired, one can see that the tips are not cylindrical-tapering and fimbriate as in *C. reticulatum*, but complanate and, as was remarked by Berkeley in the original description, recall in their habit species of *Chondrus*. The expression, flabelliformi-dilatata, used by Berkeley does not apply certainly to our plant.

There have been few references in mycological literature to *Corticium tremellinum* since its original publication. In Grevillea 20, 13, Sept. 1891, the var. *reticulatum* is called by Cooke *Corticium reticulatum*; the original name, *C. tremellinum* and its variety, are retained in Saccardo's Sylloge 6, 632, 1888, and by Massee in Jour. Linn. Soc. 27, 146, 1890, and O. Kuntze in Rev. Gen. Plant. 2, 873, 1891 changed the name to *Terena tremellina*. References to *Tremella fuciformis* are more numerous. There may be mentioned here Patouillard, Essai Taxonomique 21, Duss, Champignons Guadeloupe et Martinique 9, and Hennings, Verh. Bot. Ver. Brandenburg, 40, 113, 1898 where the species is reported as occurring in hot houses at the Botanical Garden of Berlin. A. Moeller in Protobasidiomyceten 115 et seq., 1895, gives a detailed account of *T. fuciformis* found by him in Brazil. Although he had been unable to examine a type specimen of the species, there can be no reasonable doubt that the fungus studied by him was the true *T. fuciformis*. He mentions the great resemblance in habit to *Chondrus* and his photograph, Pl. I, f. 5, shows that it is not our plant. Apparently also the spores are ovoid and not of the same shape as in *C. reticulatum*.

In North America *T. fuciformis* has been reported by Atkinson, Mushrooms, 206, f. 207, 1901, by R. Campbell, Canadian Rec. Sci. 9, 98, 1903, and by Brown and Fernekes, Bull. Wis. Nat. Hist. Soc. 2, 55, 1902. Whether the species referred to by the writers above named is the *T. fuciformis* of South America and the West Indies or the *C. reticulatum* of Pennsylvania and Vermont I am not at present

able to say. From the plate of Atkinson, together with his description including the account of the spores, I am inclined to believe that his plant is the same as that found in Vermont. So much can be said with certainty that specimens and photograph received last September from Ohio from Mr. C. G. Lloyd show that the species extends from Vermont and Pennsylvania to Ohio.

In short, *Corticium tremellinum* B. & Rav. is not a *Corticium* but a tremelline. *C. tremellinum* B. & Rav., var. *reticulatum* is a distinct species, which should bear the name **Tremella reticulata** (Berk.) Farlow, and to it should be referred the species above mentioned. Although for reasons given I do not now think that *T. reticulata* and *T. fuciformis* are identical, it remains for those who have an opportunity of seeing both the South American and our Northern fungus in fresh condition to furnish information to settle their identity beyond all doubt. If they are identical, then the name *T. fuciformis* has priority.

SYNCHYTRIUM PLURIANNULATUM (B. & C.) Farlow. In the Botanical Gazette, 10, 243, March, 1885, it was shown that *Uromyces plurianulatus* B. & C., Grevillea, 3, 57, 1874, does not belong to the *Uridinaceae* but to the *Chytridiaceae*, and it was referred by me to the genus *Synchytrium* with the statement that "the peculiarity of the ripe resting spores shows that the development must be studied before the exact position of the fungus can be decided." The hosts given were *Sanicula marilandica* and *S. Menziesii*, with a range from Illinois and Alabama to California. At that time I had been able to examine only dried specimens. Since then I have found the parasite on *S. marilandica* at Holderness, N. H., but in very small quantity, two leaves only being infected. I did not, when collecting it, recognize that the fungus was the same as that which I had studied from dried material for, when fresh, the appearance is more that of a gall of animal origin than of a *Synchytrium*. An examination of fresh material enabled me to see a character not noticed in the dried. The resting spores, or more properly sporangia, were not free in the enlarged epidermal cells in which they were parasitic but were attached at the centre of the flattened side to a hypha similar to that of *Urophlyctis Kriegeriana*, figured by Magnus in Annals of Botany, 11, Pl. 7, 1897. It was not possible for me to study the development of the fungus owing to the very scanty material and absence of proper equipment at the time it was collected, but it is evident that it must be

removed from *Synchytrium* and be placed in *Urophlyctis*. The name to be adopted is **Urophlyctis pluriannulatus** (B. & C.) Farlow. Its relation to *U. Kriegeriana* is very close and it may even be a question whether the species of Magnus, described in 1888, Sitzber. Ges. Naturf. Freunde, Berlin, p. 100, is not the same as the American species. The former grows in the epidermal cells of *Carum Carui* and the description of the galls formed as pearl-shaped with a depressed umbo at the apex applies well to those of *U. pluriannulatus* when seen in fresh condition and in general the microscopic characters of the galls and the sporangia are much the same in both species. The development of the American species, however, needs to be studied by some one living in the region where the fungus is less rare than in New England.

Although rare in the Northeastern States it is common apparently in the Central States and on the Pacific Coast. In Herb. Farlow it is represented by specimens not previously enumerated in the Botanical Gazette, l. c., as follows: Michigan (*H. L. Merrow*); Wisconsin (*J. J. Davis*); Illinois (*C. A. Hart*); Iowa (*B. D. Halsted*); Kansas (*Kellerman & Carlton*). In these states the hosts were *S. marilandica*, *S. gregaria*, and in one case, as it is said, *S. canadensis*. On the West Coast it has a range from San Diego Co. on *S. bipinnatifida* (*C. R. Orcutt*), La Honda (*T. S. Brandegee*), Santa Barbara on *S. arctopoides* (*Mrs. Brigham*), Tamalpais (*H. W. Harkness*), and Mendocino Co. (*W. C. Blasdale*) in California to Eugene, Oregon (*A. R. Sweetser*) and Mt. Tacoma on *Ligusticum apiifolium* (*E. W. D. Holway*), the common host plant in the Pacific States being *S. Menziesii*. It was distributed by Seymour & Earle in Economic Fungi Suppl. A, 10, and by Ellis & Everhart in North American Fungi, no. 1806, Fungi Columbiana, no. 652, and Winter, Fungi Europaei, no. 3474. The name *Caecomurus pluriannulatus* was given to the species by Otto Kuntze in Rev. Gen. Plant. 3², 450, 1898, in ignorance of the fact that it is not a *Uromyces*.

PUCCINIASTRUM ARCTICUM (Lagh.) Tranzsch. A few years ago while examining some leaves of *Rubus occidentalis* collected near Cambridge, which were infested with *Chrysomyxa albida* J. Kühn, a species placed in *Phragmidium* by recent writers, I found a very small but striking uredo, which did not apparently have any connection with the *Chrysomyxa* since it had a pseudoperidium such as is found

in certain melampsoraceous genera. A further examination showed very small teleutosporic sori, difficult to see, as they are concealed by the hairs on the *Rubus* leaves. I then searched among the unnamed uredoes on *Rubi*, which had gradually accumulated in the herbarium and found that the uredo in question was well represented in several collections, especially on *Rubus neglectus* Peck¹ and also less frequently on *R. strigosus*. It was abundant on specimens collected near the Bussey Institution in Oct. 1875, and also on specimens from Newton, Mass., in Sept. 1877, in company with a *Phragmidium*. In the Newton specimens both uredo and teleutospores were abundant. I have also specimens from Arlington, Mass. (*B. M. Davis*), from Ellis River, N. H. (*L. M. Underwood*), and from Madison, Wis. (*W. Trelease*), not to mention some recent collections. The uredo, which is scattered over the under side of the leaves, is at once distinguished by its peculiar peridium, which is conical, truncate, and contracted at the very narrow mouth, which is surrounded by a crown of from three to six cells, whose upper surface is aculeate, while below they are constricted, the wall of the lower part being much thickened. Around the base of the peridia, which are usually from 80 μ –90 μ in height and from 70 μ –75 μ in diameter at the base, there is a collar formed by the ruptured epidermis. The other cells of the peridium are irregularly rhomboidal, nearly transparent so that the spores beneath can be seen, and nearly smooth. Those above are longer than those below and in well developed specimens they have a more or less linear arrangement. The spores when young are generally obovoid but fully developed and especially the free spores have a very constant ellipsoidal shape, the average being 16–18 μ by 11–12 μ , some being as long as 22 μ . The surface is somewhat rough but not spiny.

This uredo is the same as the one described by Dietel in Hedwigia 44, 330, Aug. 1905, of which he gave a characteristic figure. He considered it to be connected with *Phragmidium gracile*. The host is not mentioned but it is probable that Dietel's material came from the United States. While it is true that the uredo sometimes occurs in company with *Phragmidia* its real connection is without doubt with the teleutospores which I have referred to, for both belong to the melampsoric group and furthermore they are found together in cases where no *Phragmidia* are present. The only question seems to me to

¹ I am indebted to Prof. M. L. Fernald for the determination of the species of *Rubus* cited in this paper.

be whether the fungus on *Rubi* in the Northeastern United States is *Pucciniastrum arcticum* (Lagh.) Tranzschel, of which the uredo was first described on *Rubus arcticus* from Lapland by Lagerheim in *Hedwigia* **28**, 109, 1889, and the teleutospores by Tranzschel in *Script. Bot. Hort. Univ. Imp. Petrop.* **4**, 300, 302, 1895, from Finland and the Ural and on *R. saxatilis* near St. Petersburg. If not, it is certainly a closely related species. *P. arcticum* is given by Arthur in *N. Am. Flora* **7**, part 2, 107 as occurring on *R. stellatus* from Alaska in its uredo-form.

The only American specimen I have seen, which seems to belong to the typical *P. arcticum* is one collected at Grand Manan, N. B., on *R. triflorus* by Prof. K. Miyabe. Of European specimens I have examined the no. 857 of Vestergren, *Microm. Rar. Select.* in which the teleutospores are not present. There is nothing in the teleutospores of the New England fungus which would enable one to distinguish them from those described by Tranzschel. His description is as follows: "sori teleutosporarum hypophyllis, fuscis, parvis, planis. Teleutosporis globosis vel mutua pressione rotundato-cubicis, in cellulas 2-4 longitudinaliter divisis, intercellularibus, 19-25 μ diam." Newton specimens afforded excellent material of teleutospores. The sori are hypophyllous and only slightly raised above the epidermis. I have in but one instance seen teleutospores on the upper surface of the leaf. The sori vary very much in size, some being very minute with not more than a dozen spores, while the diameter of the larger sori is often as much as 180 μ . The expression, intercellular, as applied to species of *Pucciniastrum* is not altogether clear. In our specimens it is not difficult to see that the beginning of a sorus is beneath a stoma. The mycelium running horizontally in the palisade-cells buds out and produces an ovoid cell, which soon divides into two by a vertical wall and the process is repeated so that, seen from above, the spores are arranged in groups of two and fours. Other buds are formed from the adjoining mycelium and as the mass of the sorus is formed the closing cells of the stoma are torn apart and the sorus is then covered only by the compressed adjacent epidermal cells. It is not clear whether spores borne in this way can be said to be intercellular or not, but it is easy to see the formation of sori beneath the stomata beginning with a single spore or pair of them.

If our plant is to be distinguished from *P. arcticum* it must be by

the characters of the uredo. The pseudoperidium of *P. arcticum* is described as "mammiiformiprominulo, apice pertuso; cellulis apicis pseudoperidii aculeatis." This description applies accurately to the specimen in Vestergren but, if one glances at the figure of Dietel, which is a good representation of our species, the peridium could hardly be said to be even prominently mamillate. The aculeation of the peristomal cells is a character more common in species of *Pucciniastrum* than is generally supposed. When in good condition those cells in *P. Potentillae* Komarov are distinctly aculeate. In short our New England species is distinguished from the type of *P. arcticum* in which, as is shown by Vestergren no. 857, the peridium hardly projects beyond the epidermis, by its markedly conical shape and prominent corona. If we ask what are the variations in American specimens, I can say that after examining a large number of specimens I find a certain difference in the general appearance of the peridia but, except in the specimen from Grand Manan, I find none which agree with the European type. I should regard our fungus, however, not as a distinct species, since in most essential details it agrees with *P. arcticum*, but rather as a geographical variety or, if you please, race in which there is a more marked development of the pseudoperidium. I would to distinguish it give it the name

P. ARCTICUM (Lagh.) Tranzs., var. **americanum** Farlow a *P. arctico* typico pseudoperidio conico-truncato cellulis spinosissimis coronatis distinctum.

Another *Pucciniastrum* very common on *Potentilla tridentata* of which the uredo has often been collected but to which there is scarcely any reference in mycological literature seems to me to be specifically undistinguishable from *P. Potentillae* Komarov. first described from Ninguta, Manchuria, on *P. fragarioides* in Jaczewski, Komarov & Tranzschel, *Fungi Rossiae Exsiccati* 7, no. 327, 1899. I first found it Sept. 1877 at Eastport and Portland on the Maine coast and since then I have found it on all the higher peaks of the White Mts. and as far south as Mt. Monadnock, N. H., and Berlin Mt. on the boundary between Massachusetts and New York, at Noonmark Mt. in the Adirondacks and I have specimens from White Fish Lake near Duluth collected by F. W. Dewart. It also occurs in Canada and specimens were distributed from Dr. J. Dearness in *Fungi Columbani*, no. 2367. Recognizing the resemblance of the uredo to *U.*

Agrimoniae DC., now placed in the genus *Pucciniastrum*, I kept the numerous collections on *Potentilla* next to that species but it was not until a few years ago that I was successful in finding the teleutospores which are not abundant and form small reddish brown spots on the leaves and stipules. The specimen in Fungi Rossiae has only uredosori but they agree with the fungus on *Potentilla*. Probably the species is common wherever *Potentilla tridentata* occurs.

CAMBRIDGE, MASSACHUSETTS.

THE REPRESENTATIVES OF *RUMEX SALICIFOLIUS* IN EASTERN AMERICA.

M. L. FERNALD.

IN his revisions of the North American species of *Rumex*, Professor Trelease¹ placed together as *R. salicifolius* a vast amount of material with the broad range: "Arctic America across to Alaska, south to New Hampshire, the Great Lakes, and in the mountains to southern California and Mexico, where it closely approaches *R. Mexicanus*." Then, after referring to certain variations of the species as thus interpreted, the author says: "It may be that these forms will bear separation, even from the Old World type; but the (frequently young) specimens in herbaria show as many intermediate forms and admit of so poor a geographical delimitation, that I cannot find good grounds for recognizing more than a single species."

"A more zigzag plant with broad elliptical rather firm leaves (3×8 cm.) and one valve almost covered by the very large callosity (1.5 to 2×3 to 4 mm.), the other two naked, occurs from Sta. Cruz Mountains . . . Sta. Lucia Mountains . . . and about San Francisco, Cal. . . . Others may consider this to be clearly distinct, but I leave it here for the present."

Students of the flora of Western America have recently been inclined to recognize in the aggregate *Rumex salicifolius* a number of

¹ Trelease, Third Ann. Rep. Mo. Bot. Gard. 87 (1892).

apparently distinct species; and since we have in New England and Eastern Canada two clearly separable plants which have been passing as *R. salicifolius* it becomes important to determine what they should be called.

In the first place we must determine what plant Weinmann had before him in describing *Rumex salicifolius*. This is much simpler than would be inferred from Professor Trelease's reference to "the Old World type"; for Weinmann's plant came from California and his description was very obviously based upon the peculiar local plant, with elliptical leaves and "one valve almost covered by the very large callosity, the other two naked", which Professor Trelease singled out from the aggregate as most worthy of separation from *R. salicifolius*. The original description was as follows:

"2. RUMEX SALICIFOLIUS mihi. Floribus dioicis, valvulis integerrimis; unica granifera, foliis oblongo-lanceolatis integerrimis acuminatis subtus glaucescentibus.

Radix perennis et caulis basi interdum lignescens, 2-3 pedalis, ramosus, erectus. Folia petiolata, oblongo-lanceolata, undique attenuata 6-7 uncias longa, sesquiuncias lata. Ochreae tenerrimae semper-lacerae. Verticilli congesti multiflori. In California, h. 7." ¹

This Californian plant the true *Rumex salicifolius*, which is well shown in specimens collected by Mr. A. A. Heller on the beach near the Cliff House, San Francisco, June 16, 1902, is very distinct from all the other plants which have been referred to that species not only in its short oblong or elliptical leaves, but in the solitary very large grain of the fruit; and so far as the writer is able to determine from the herbarium material at hand it is confined to the region from San Francisco southward into Monterey County, California.

The very different plant of the New England coast which has been passing under the name *Rumex salicifolius*, the familiar White Dock of our salt marshes and sea beaches, is a somewhat depressed plant, the stems (usually several) more or less reclining or decumbent, finally ascending. Its pale leaves are narrowly lanceolate and elongate, the principal ones measuring 1 to 2 dm. long, 1.3 to 2.5 cm. broad. The lower branches of its mature panicle spread nearly at right angles. Its fruiting calyx is whitish-brown, the valves 3 to 4 mm. long, but slightly exceeding the 3 conspicuous whitish ovoid or lance-ellipsoid

¹ Weinmann, Flora, iv. 28 (1821).

spongy grains (2.5 to 3×1 to 2 mm.). This plant which abounds upon sea-coasts of Nova Scotia and eastern New England becomes rather local southward, though it is said to reach the coast of southern New York; and it is gratifying to find it beautifully characterized by our own New England botanist, Jacob Bigelow, in the second edition of the *Florula Bostoniensis*, as

“**RUMEX PALLIDUS*.

White Dock.

R. foliis lineari-lanceolatis, acutis; spicis gracilibus; valvulis ovatis, integris, granum vix superantibus.

Leaves-linear-lanceolate, acute; spikes slender; valves ovate, entire, hardly larger than the grain.

Stems numerous, ascending, smooth, round, slightly furrowed. Leaves smooth, linear-lanceolate, acute, petioled, more or less waved on the margin. Spikes slender, owing to the shortness of the pedicels, the largest with a leaf at base. Calyx linear, acute. Petals ovate, obtuse, erect. Stamens six, anthers whitish, two lobed. Styles three. Fruit crowded, the valves ovate, entire or furnished with a single tooth at base, with a large, white, fleshy, obtuse grain nearly covering the back of each.—Salt marshes.—June.—Perennial.

First sent by Dr. Nichols from Danvers.”¹

The other plant of eastern America which has been passing as *Rumex salicifolius* is more upright and generally taller and greener than *Rumex pallidus*, its leaves somewhat broader (1.5 to 3.5 cm. broad), and its pedicels longer; but its chief distinctions are in the form of its panicle and the size, color, and grains of the fruiting calyx. The branches of the very dense elongate panicle are strict or very strongly ascending, not horizontally spreading as in *R. pallidus*; the valves of the olive-brown or ruddy calyx are 3.5 to 6 mm. long, their tips much exceeding the 2 or 3 narrowly ellipsoid to subulate brown grains (2 to 2.5×0.5 to 1.5 mm.); and the achenes are smaller than those of *R. pallidus*. This plant, with the strict inflorescence, darker and longer fruiting calyx and slender grains, replaces *R. pallidus* on the coasts of eastern Quebec, Newfoundland, and Labrador, and extends from sea-level in the East westward to Assiniboia and British Columbia, south very locally to central Maine, Michigan and Missouri; and along the Rocky Mts. at altitudes ranging from 1675 to 2750 meters (5500 to 9000 feet) to central Mexico and even to Mt.

¹ Bigelow, Fl. Bost. ed. 2, 143 (1824).

Orizaba. This is the plant which was described in 1856 by Meisner¹ as *Rumex mexicanus*, a name which may seem doubtfully applicable to a plant which extends into the northern Rocky Mountains and eastward across Canada to the Gulf of St. Lawrence. But this range is in reality a very natural one and it is followed by more than sixty of our best marked northeastern species, such as *Ranunculus Cymbalaria*, *Rumex persicarioides*, *Lonicera involucrata*, *Limosella aquatica*, *Veronica americana*, &c., which, crossing the boreal district of North America, extend southward along the Rocky Mountain System to northern and central Mexico; and *Chimaphila umbellata*, *Pyrola secunda*, *Cystopteris fragilis*, *Asplenium Trichomanes*, &c., which reach the high summits of Mt. Orizaba or of the Volcan de Fuego in Guatemala, where the last named species is found above 3350 meters (11,000 feet).

GRAY HERBARIUM.

SCIRPUS HUDSONIANUS IN RHODE ISLAND.—On June 22d, while in company with Prof. J. Franklin Collins the writer discovered *Scirpus hudsonianus* (Michx.) Fernald (*Eriophorum alpinum* L.), in a cold bog not far from Diamond Hill in the town of Cumberland. At only one other station known to the writer has this plant been discovered so far south. In RHODORA [1900] Mr. Roland Harper refers to it as occurring at Willington, Connecticut, which is at about the same latitude as the Rhode Island station reported above.—ERNEST SHAW REYNOLDS, Providence, Rhode Island.

[*Scirpus hudsonianus* occurs at a number of stations besides Willington in Tolland County, Connecticut. One of these, Storrs, where the plant was recently found by Professor A. F. Blakeslee, is about twenty miles further south than the Diamond Hill station.—Eds.]

¹ DC. Prodr. xiv. 45 (1856).

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